Asia Pacific Education Review
2003, Vol. 4, No. 2, 129-139

Distribution of Public Education Spending for the Poor: The Case of Yemen

Takako Yuki

University of Tokyo
Japan

This paper explores the issue of how a country for which the prioritization of public spending towards poverty reduction is a key policy concern can monitor the distributional effects of public spending. Employing standard benefit-incidence analysis, this paper empirically examines how public education spending is currently distributed in Yemen. It also considers the extent to which the distributional benefit to the poor should and can be improved, focusing on possible changes in cost sharing for higher education and on associated changes in budget allocations. The findings support the government's decision to increase cost sharing while maintaining a high overall level of public education spending and provide a benchmark from which to monitor the impact of this and other education spending decisions on the poor.

Key Words: poverty reduction, public education spending, distribution

Poverty reduction has recently been reemphasized as the primary objective of international development efforts and the role of education in poverty reduction has been highlighted in this regard (e.g., Asian Development Bank, 2002; World Bank, 1999a). This concern is also reflected in a resurgence of interest in the relationship between poverty and public spending in developing economies, which has fostered the return of a so-called "benefit-incidence analysis," particularly for public spending in the social sectors (Younger, 2003), including education. Among several approaches, the most popular method attempts to assess how effectively public education spending is distributed across the population--in particular between the poor and the rich--classifying the population on the basis of an indicator that represents either household income or consumption (also called "expenditure-incidence analysis").

Previous standard benefit-incidence studies (e.g., Castro-Leal et al., 1999) typically found that the distribution of public education spending favors the poor in proportion to household income but is less likely to favor them in absolute terms, especially at a higher level of education. The results have generally supported the following policies for improving the distribution of spending for the poor: 1) increasing public resources to education while aligning sub-sectoral budget allocations, often towards primary education; and 2) introducing cost-recovery and/or private provision at a higher level of education. Using the results of 43 standard benefit-incidence studies from 34 developing countries**,** a regression analysis of variations in the incidence of public education spending also implied that increased spending on education would be associated with an increased share for the poor given that it is not devoted to spending on higher education (Yuki, in press).

Yemen is an example of a country that is actively fighting against poverty with the help of international partners. While aware of challenges to international development goals in the education sector, the government, in its poverty reduction strategy, aims to increase financial commitment to this sector and increase cost sharing in higher education (Republic of Yemen, 2002b). Nevertheless, empirical information about how public education spending has historically been

Takako Yuki, Research associate, at the Research Center for Advanced Science and Technology, the University of Tokyo. Correspondence concerning this article should be addressed to Research Center for Advanced Science and Technology, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo, 153-8904, Japan. Electronic mail may be sent to yuki@ip.rcast.u-tokyo.ac.jp.

distributed to the poor or lower income groups is unavailable, and thus there is no benchmark from which to monitor the impact of policy changes.

This paper aims to empirically examine how public spending is currently distributed across the population in Yemen. It will also consider to what extent the distributional effect for the poor should and could improve, with a focus on changes in cost sharing in higher education and the associated changes in intra-sectoral budget allocation. The paper will begin with an overview of the education system and spending and proceed to examine the distribution of public education spending.

Overview of Education System and Spending

Structure of Education and Financing

Until reunification in 1990, the education system had a different structure in North and South Yemen (Republic of Yemen, 2002a). After reunification, the two systems were merged into a single system that consists of nine years of compulsory basic education, three years of secondary education, and two to six years of higher education. Children are officially entitled to start basic schooling at age six. Vocational and technical training is available after basic and secondary education. According to data of the Republic of Yemen (2000), most students at the end of the 1990s were enrolled in public institutions and the private provision of education was very limited.

In 2002, many changes in sectoral administration were introduced due to new laws regarding decentralization of higher education and to the fact that a new cabinet was formed in April 2001. Until then, the central government had been the main financer of public education, with a centralized budget allocation and execution mechanism.[1] However, no single government authority was responsible for preparation and execution of government budgets allocated to the education sector as a whole. The Ministry of Education was responsible for basic and secondary education, while the General Authority for Vocational/Technical Training handled vocational training. The Higher Council of Universities, chaired by the Prime Minister, loosely oversaw public universities, which were fiscally independent. In principle, public education did not charge tuition fees to Yemeni students at any level until the late 1990s, when the government began proposing the introduction of controversial university tuition fees. The government does not provide direct subsidies to private education.

Public Spending on Education and Intra-Sectoral Allocations

Government expenditures on education grew from 16.6% of total public expenditure in 1996 to 23.2% in 2000 and from 5.1% of GDP to 6.1% for the same period (World Bank, 2002), which is high compared with most Asian countries. For example, among 41 Asian countries for which data are provided in UNESCO (2000), Yemen's public education spending is the sixth highest with respect to share of GNP. Within the sector, basic and secondary school spending accounts for more than 80% of total public education expenditure while higher education received between 11 and 16% of the total budget, which is not high. For example, Bray (2000) says in his analysis of higher education financing in Asia, "most analysts would consider allocations below 10% to be low, but ones above 25% to be rather high." However, a glance at sub-sectoral allocations divided by recurrent and investment expenditure shows a worrisome trend. The share of basic and secondary education in recurrent expenditure was relatively stable at nearly 90% during the period 1996-2000, whereas the share in investment expenditure declined from 66% to 54% during the same period and the share of higher education and vocational education increased (World Bank, 2002). This trend may cause an increase in future recurrent requirements in higher education and vocational training.

Public Spending Per Student by Sub-Sector of Education

Table 1 shows the estimated unit cost as yearly recurrent spending per student for the sub-sectors of education in 1998. It shows spending of 23% of GNP per capita for basic education, which is relatively high as compared to other Asian developing countries. Although the spending increases with the level of education, the differences are not very wide. The unit cost for higher education was about four times as much as the unit cost for basic education, and vocational training costs 5.6 times as much. For university education, this analysis excludes spending on scholarships/fellowships abroad, for which there is no systematic data available.

Method and Sources

Benefit-incidence analysis in the education sector began with a study of higher education financing in the United States (Hansen & Weisbrod, 1969). For developing countries, Jallade (1974) was the first to analyze the benefit-incidence in detail, followed by Meerman (1979) and Selowsky (1979). Recently, a fairly standard method, which aims to measure the

Table 1. *Student in Public Institutions, Recurrent Expenditure, and Unit Cost, Yamen, 1998*

	Student	Recurrent expenditure		Unit cost per student exc. Scholarships abroad			
		Total (YR, mil)	Excluding scholarships abroad (YR, mil)	(YR)	(US$) (c)	(% of GNP pc)	(Ratio to Basic)
Basic (a)	2,847,941	33,262	31,249	10,973	77	23	1.0
Secondary (b)	336,321	5,870	5,870	16,397	116	34	1.5
University	97,593	4,914	4,914	41,270	291	85	3.8
Vocational Training	7,052	433	433	61,420	433	126	5.6

Notes. (a)As there was no official data on expenditure separately recorded for basic and secondary education, it is estimated recurrent expenditure of the Ministry of Education ws spent on basic education on student-to-teacher ratios between these two levels. See World Bank (2002) for details. (b)Exchange rate was US$1=YR 141.7 in 1998 (International Moneraty Fund, 2001, p. 145). (c)GNP per capital is YR 48624 from the World Development Indicator 2001 (CR-ROM).
Sources: Student data are for the 1997/1998 school year from the Republic of Yemen (1999a). Expenditure data represents the actual expenditure in 1998 from the final accounts of the Ministry of Finance

effectiveness of public spending as regards the transfer of current benefits to the poor, has been increasingly used for developing countries.

I employed this standard method in the case of Yemen, mainly using data from the 1998 Household Budget Survey (1998 HBS), in the following three steps. First, the unit costs presented in Table 1 are considered as unit education subsidies. Household expenditure on education is not deducted from these unit subsidies because there were no tuition fees charged for public education at all levels in 1998.

Second, the unit cost data are combined with the information on the current enrollment status of all household members in the 1998 HBS. The 1998 HBS is the best source of recent information for distributional studies in Yemen. It covers about 13,641 households and 97,544 individuals, basing the reference population on the 1994 Population Census (Republic of Yemen, 1999b). The sample households were selected using the two-phased cluster sample method. The survey was conducted during the whole year (January-December 1998) by dividing the total sample over four rounds. For each member aged six or over, there is information on the enrollment status (i.e., whether the student was currently enrolled in school or not) and the current level of education at which the student is enrolled.

Third, households and individuals are ranked on the basis of a representative welfare indicator (monthly per capita household expenditure) and divided into five groups (quintiles) so that education subsidies in each quintile can be estimated and compared. The bottom quintile (20% of households or individuals) is considered the poorest group. In fact, most of the bottom quintile population can be also classified as "poor" using the food poverty lines, which are YR 2,101 per person per month according to the World Bank (2002). In some countries, social classifiers, such as ethnicity, caste, and religion are important, especially when these have been reflected in sector policies (see e.g., Crouch, 1996). However, this was not the case in Yemen.

Distribution of Public Education Spending: Current State

Estimated Distribution between Poor and Rich Households

Figure 1 shows how public education spending is distributed across household quintiles. Lower quintiles' shares of total education spending are higher than their shares of household expenditures, and thus public education spending as a whole is more equitably distributed than expenditure. In all sub-sectors, public education spending is better distributed to the poorest quintile than household expenditure. The share of total public education spending for this quintile (22.6%) and its share of spending on higher education (13.2%) are both larger than its share of household expenditure (9.3%).

Apparently, this poorest quintile's share of total public education spending is larger than its share of total households, whereas the richest quintile's share (15.8%) is smaller. In other words, the distribution of total public education spending also moderately favors the poorest households in absolute terms. However, in absolute terms, in higher education and vocational training the distribution of public spending does not favor the poor but favors the rich, whereas it moderately favors the poor in basic education and it is almost neutral in secondary education. The poorest 20% of households receive 25.1% of

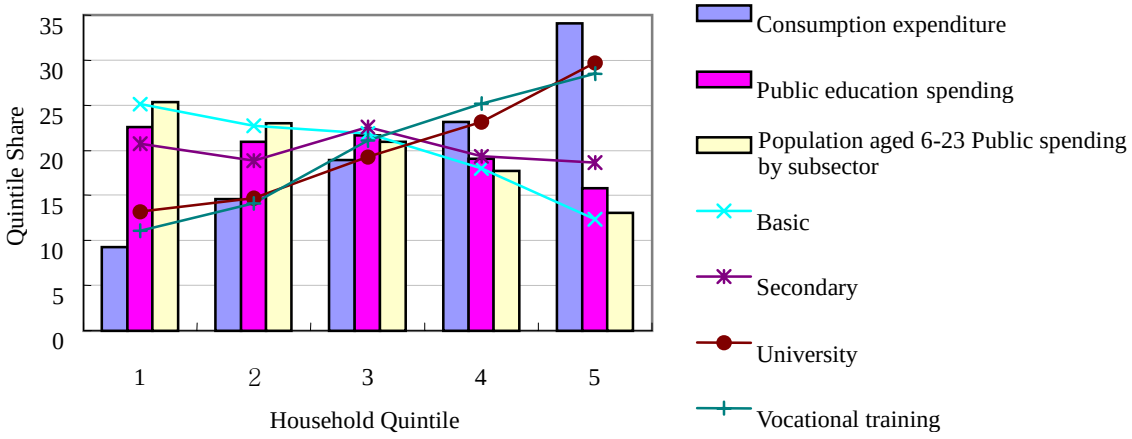

Figure 1. *Distribution of Public Education Spending by Household Quintile*

public spending on basic education, while the richest 20% households receive 12.3%. The pattern is opposite for university spending, for which the poorest quintile receives 13.2% but the richest quintile receives 29.7%.

Figure 1 also shows that even the distribution of public spending on basic education cannot be judged pro-poor when it is assessed in proportion to the school-aged population (age 6 to 23 years old) in each household quintile, so that the analysis reflects the fact that poor households tend to have more children. For the bottom two quintiles, their shares of public education spending are lower than their shares of the school-aged population in all sub-sectors. Although their shares of basic education spending are almost the same as their shares of the school-aged population (6-23 years old), these

Table 2. *Distribution of Public Education Spending, Yemen, 1998*

	Quintile					
	1	2	3	4	5	Total
Household Quintile						
Quintiles share of total households(%)	20.0	20.0	20.0	20.0	20.0	100
Quintiles share of population aged 6-14(%)	27.2	24.0	21.2	16.6	11.0	100
Quintiles share of total education subsidies(%)	22.6	20.9	21.6	19.0	12.3	100
Basic education	25.1	22.7	21.9	18.0	12.3	100
Individual Quintile						
Quintiles share of total population(%)	20.0	20.0	20.0	20.0	20.0	100
Rural share of quintile population(%)	86.2	79.4	77.3	74.8	66.8	76.9
Female share of quintile population(%)	49.2	49.5	49.5	49.5	49.4	49.4
Household consumption expenditure(monthly/per capita/YR)	1,626	2,666	3,618	4,947	9,331	4,436
Quintiles share of population aged 6-14(%)	23.2	21.8	20.1	19.0	15.9	100
Quintiles share of monthly expenditures(%)	7.3	12.0	16.3	22.3	42.0	100
Quintiles share of public education spending(%)	19.0	18.3	20.3	20.7	21.6	100
Basic education	21	20	21	20	18	100
Education subsidy, total (yearly/per capita/YR)	3,110	3,000	3,327	3,392	3,544	3,274
(% of household expenditure)	15.9	9.4	7.7	5.7	3.2	6.2
Urban population (yearly/per capita/YR)	4,473	4,718	4,952	5,008	5,154	4,923
Rural population (yearly/per capita/YR)	2,891	2,554	2,850	2,847	2,744	2,779
Male (yearly/per capita/YR)	4,373	4,153	4,618	4,695	4,871	4,542
Female (yearly/per capita/YR)	1,804	1,822	2,011	2,064	2,187	1,978

Note. Households or Individuals are ranked on the basis of per capita household consumption expenditure.
Source. Author's estimation using data in Table 1 and the 1998 HBS.

shares are smaller than their shares of the basic school-aged population (aged 6-14 years old) (See Table 2).

Estimated Distribution Across Individuals and Differences by Rural-Urban Areas and Gender

Table 2 shows, as expected from the above results, that when the distribution of total public education spending is assessed across individuals rather than households, it does not favor the poor in absolute terms. While the poorest 20% individuals receive 19% of total public spending, the richest 20% individual receive 20%. The poorest quintile, on average, receives YR 3,110 per capita, and the richest quintile receives a little more, YR 3,544. Certainly, in proportion to per capita expenditure, the distribution is pro-poor, as education subsidy per capita is about 15.9% of household expenditure per capita per year for the poor and this proportion becomes smaller in a higher quintile.

When quintile populations are disaggregated by urban-rural area and by gender, it is found that, within any quintile, rural populations and females receive much less education subsidies than urban populations and males. Within the poorest quintile, the rural population receives YR 2,891 per capita, only 65% of what the urban population receives. Among rural populations, the distribution moderately favors the poor in absolute terms, but it does not favor them among urban populations. Among females the gap between rich and poor is slightly wider than it is among males. The average education subsidy for females in the poorest quintile is only 40% of the average for males in the poorest quintile and 37% of the average for males in the richest quintile. Even for public spending on basic education, females, on average, receive only 49% of the males' average within the poorest quintile and 57% within the richest quintile.

Measurement Issues

In the interpretation of the above results some measurement issues, which are partly caused by data limitations for Yemen but are often common issues in adopting the standard method, should be noted. These measurement issues might cause an under-or over-estimation of the benefit-incidence for the poor. First, the above analysis assumes that all students were enrolled in public schools or institutes. Overall, this is less likely to distort the estimation results because the share of private enrollments is very small in Yemen. However, in urban areas, the private share is estimated slightly high (3.3% in basic, 2.4% in secondary and 7.7% in higher education).[2] Thus, when the analysis excludes benefits for those enrolled in private institutions, the incidence for the richest quintile, which has a higher urban share of population, may become slightly lower and the incidence for the poor may become higher.

Second, the analysis assumes that the unit cost was constant within each sub-sector. This might cause an under- or over-estimation of the incidence for the poor when the unit cost varies in relation to income (e.g., the unit cost of basic education is lower in communities where more poor reside). In fact, in Yemen the unit costs of basic and secondary education were estimated to greatly vary among regions or governorates (World Bank, 2002). However, using the regional average unit costs (for 17 governorates and one capital city in 1998), the reestimated distribution of the total public education spending across individual quintiles is almost the same as the above results, which used the national average unit costs (e.g., the poorest quintile's share is 19% in both estimations).

Third, the analysis does not include public spending on scholarships abroad, which are subsidized by the government to a considerable degree but for which the beneficiaries in the 1998 HBS are impossible to identify or to estimate the unit cost. Although this might cause an overestimation of the benefit-incidence for the poor, the magnitude is estimated as marginal. According to the Ministry of Higher Education and Scientific Research, there are three main types of government-financed scholarships abroad: 1) cultural exchange programs by undergraduate and graduate studies, for which each governorate is allocated a certain budget and selects students based on their achievement at the end of secondary education; 2) fellowships abroad for prominent university students to advance their studies; and 3) scholarships to subsidize costs for some students who have already started studying abroad. The third type tends to benefit rich households but the first and second types do not necessarily have this tendency. Even if it is assumed that each quintile's share of public spending on scholarships abroad is the same as its share of spending on higher education in general, the reestimated distribution of total public education spending across individual quintiles will become pro-rich, but very slightly (e.g., the poorest quintile's share would decline by only 0.5 percentage points).

Fourth, as is common in standard benefit-incidence studies, the analysis did not include benefits from investment expenditure and focused on the distribution of current benefits. It was impossible to estimate value from physical capital or to back-estimate the benefit-incidences from past investment expenditure. Taking into consideration only the trend of increased share of investment spending on university and vocational training, which could benefit the poor less in

coming years, the estimated distribution of public spending may decrease for the poor if investment spending is included.

Distribution of Public Education Spending for the Poor: Possibilities for Future Change

The current state of distribution of public education spending suggests the need for changes in spending on the education sector and across its sub-sectors to make the net effect more pro-poor. This may, for example, involve spending more on basic education in rural areas and less on higher education. Meantime, it implies the need for changes in spending within each sub-sector where present spending is not adequately pro-poor. These changes are expected to contribute to increasing the distribution of benefits to the poor so as to make overall education spending more equitable. For example, in proportion to the school-aged population, the above estimation results suggest that the poorest quintile's share of total public education spending should be increased by at least several percentage points.

However, a standard benefit-incidence analysis at any given point in time has methodological limitations for guiding changes in public spending because it assumes that the observed incidence of current spending would also hold for any additional spending (Demery, 2000). In reality, this "average" incidence may be different from the distribution of a spending change ("marginal" incidence or gains; Lipton and Ravallion, 1995). Unfortunately, this study cannot estimate marginal incidences because there is no data that allow the benefit-incidence analysis for two points of time and because the 1998 HBS does not provide adequate information on education services (e.g., distance to school from households) to allow for estimating changes in household demand for education or calculating differences between the poor and the rich. Nevertheless, to partly compensate for this methodological limitation, this section will first compare the results for Yemen with benefit-incidence studies for other countries and attempt to draw targets and policy insights for increasing the distribution of public spending for the poor, with a focus on intra- and inter-sectoral budget allocations. It will then consider changes in cost sharing for higher education as an option for increasing public resources available for basic education.

Cross-Country Comparison

Overall, the results for Yemen are consistent with findings for other developing countries. That is, public education spending is more equally distributed than household income or expenditure, but in absolute terms public spending on education is not distributed progressively but frequently regressively, especially at higher levels of education. However, beyond this general finding, as shown on Table 3, a cross-country comparison of the exact share of public education spending distributed to the poorest 20% suggests that the distribution of spending on education as a whole is relatively less inequitable for Yemen.

The lesser degree of inequality might be partly explained by the fact that Yemen realizes two key allocation policies which are expected, from previous studies, to contribute to better distribution of public spending for the poor: 1) a high level of public spending on education; and 2) within the sector, a low (but moderately low) proportion of recurrent spending allocated to higher education. Although the number of countries compared is small, Table 3 still indicates that among countries with low socioeconomic development as measured by per capita GDP and literacy rate, Yemen spends more on education than most, with a smaller share devoted to higher education. In addition, it may be another factor that the country does not show a huge difference in per student public spending between basic and higher education, which is generally a reason for a high share of spending for the rich, who tend to have fewer children but to enroll more children in expensive and subsidized higher education. These factors, which are likely to be associated with better distributional consequences of public spending, should be firmly maintained.

In addition, the cross-country comparison also suggests that Yemen needs new measures that could further increase the distribution of public spending to the poor. Table 3 shows that Yemen is ranked higher in targeting spending on secondary and tertiary education for the poor, but not in spending on basic education. This implies that a policy change that could increase the share of public spending on basic education for the poor without a reduction in their share in secondary and higher education may improve the distributive impact of public spending on education as a whole. Also, a key to improving the share for the poor is to increase the distribution for females and rural population, who, as discussed above, currently face proportionately less access to benefits than their male and urban counterparts.

Feasibility and Impact of Cost Sharing

To increase the share of public spending on basic education for the poor, through an increase in either the number of beneficiaries or the unit cost per beneficiary among the poor,

Table 3. *Poorest Quintile's Share in Public Education Spending in Selective*

Country	Benefit-Incidence Study							Aggregated Data (c)			
	Year of Data	Unit(a)	Poorest quintile's share in (b)				Source	Public education spending(% of GNP)	Higher education share of recurrent education spending(%)	GDP pc(constant 1995 US$)	Illiteracy rate (% of ages 15 and above)
			Total	Primary	Secondary	Higher					
Romania	1997	I	24.0	31.0	26.0	10.0	Tesliuc. et. al(2000)	3.6	16.0	1,373	2.2
Columbia	1992	H	23.0	39.0	21.0	5.0	World Bank(1994)	3.5	14.8	2,168	10.7
Yemen	1998	H	22.6	25.1	20.7	13.2		7.0	11.0	283	56.0
Peru	1997	I	20.6	28.4	15.5	6.2	World Bank(2001b)	2.9	16.0	2,405	11.2
South Africa	1993	I	19.9	25.8	18.8	6.1	Castro-Leal(1996b)	7.1	15.0	3,788	17.4
Cote d'Ivoire	1995	H	19.4	28.8	11.2	...	Demery(2000)	5.3	16.4	720	59.6
Yemen	1998	I	19.0	21.3	17.0	10.4		7.0	11.0	283	56.0
Macedonia, FYR	1996	I	18.5	25.4	12.6	7.1	World Bank(1999b)	5.1	22.0	1,275	
Kenya	1992	I	17.0	21.8	6.4	2.0	World Bank(1995b)	6.7	17.7	337	26.4
Ghana	1992	I	16.4	21.8	14.9	6.0	Demery, et. al.(1995)	4.5	11.0	363	38.8
Malawi	1995	I	16.0	20.0	9.0	1.0	Castro-Leal(1996a)	5.4	20.5	146	44.1
Bangladesh	1994	H	13.8	19.4	6.0	0.0	World Bank(1996a)	2.2	7.9	307	62.7
Tanzania	1994	H	13.0	20.0	7.6	0.0	World Bank(1999c)	5.0	...	176	31.1
Morocco	1999	I	12.0	21.1	7.3	1.7	World Bank(2001a)	5.0	16.5	1,359	52.0
Lao	1993	I	11.6	18.4	6.6	0.0	World Bank(1995a)	1.9	3.9	349	60.2
Educator	1998	I	11.0	24.0	9.0	1.0	World Bank(2000d)	3.5	21.3	1,560	9.4
Madagascar	1994	I	8.3	17.2	2.0	0.0	World Bank(1996b)	2.2	24.6	241	38.5
Albania	1996	I	...	27.0	7.2	7.5	World Bank(2000b)	3.1	10.3	828	17.9
Vietnam	1998	I	...	26.1	8.6	0.6	World Bank(2000c)	3.0	22.0	330	7.1

Notes. (a) Unit: H, Household is a unit of analysis, I; Individual is a unit of analysis. (b) For some counties, primary education refers to basic education. For Vietnam, the data for secondary at the arithmetic averages of junior and secondary education. Information is not available. (c) Data from the World Development Indicator 2001(CD-Rom), except for higher education share of recurrent education spending, which is the author's calculation using data on current public expenditure by level of education from UNESCO statistics on-line (http://www.uis.unesco.org/pagesen/dbexplevel.asp,retrieved in 2002). For Yemen, there is no data in the UNESCO statistic database,, the data came from Table1 .

the government will need to increase public resources available to this sub-sector while increasing internal efficiency within the sub-sector (i.e., providing more and/or better quality services with a given amount of resources). However, it may not be fiscally sustainable to implement a further increase in budget allocations to basic education, which would increase the allocations to education as a whole, because Yemen is already spending a considerable amount on this sector. A typical alternative is to reallocate public funds from higher education to basic education while increasing revenues from the private sector and households, often involving cost sharing for some students while subsidizing poor students through grants and scholarships.

Despite the opposition of students who claim that university tuition fees are against the Constitution and that it is the government's responsibility to provide free education,[3] cost sharing may be an inevitable policy decision. For example, Bray says, "the 1980s and 1990s brought a worldwide change of emphasis in the matter of cost sharing and cost recovery in education [and] this change of emphasis has affected Asia as well as other regions" (Bray, 2002, p. 32). In particular, such a change may be considered feasible when students and their families can afford to pay more of the cost of education. Therefore, using the 1998 HBS, the study examined to what extent households currently spend on education and how household education expenditures differ between poor and rich households. As expected from the free tuition policy at all levels of education, the largest share of total education spending per household is attributed to the government (91.1%).[4] Figure 2 shows that poor households spend less on education than the rich in absolute terms although they spend more in proportion to household expenditures. For example, among the poorest quintile, each household, on average, spends about YR 1,300 on education per year or 0.8% of household expenditures. On the other hand, among the richest quintile, each household, on average, spends about YR 4,000 or 0.6% of household expenditures. Even when the average household education expenditure per student is estimated only for households that have at least one student, a household in the poorest quintile still spends more proportionately (3.1% of per capita household expenditures) than does a household in the richest quintile (2.5% of per capita household expenditure).

Figure 2 also shows differences in the composition of household education spending between the rich and other sectors of society. Among households in the richest quintile, more than half of education expenditure is spent on private schooling, private lessons, and university education. On the other hand, such expenses account for only 10% among the poorest quintile. Accordingly, when spending on private schooling and lessons is not included so that the analysis focuses on out-of-pocket expenditure to gain access to public education services, the household education expenditure picture becomes more regressive. These findings imply that the direct cost of schooling is not a negligible burden for poor households, but that rich households could afford to pay more for education.

If the introduction of affordable tuition fees could contribute to better targeting of public spending for the poor, such a policy change might receive more support from the public. For example, Table 4 illustrates possible impacts on the share of public education spending for the poorest household quintile of changes in cost sharing for university education, with the reallocation of public funds from higher to basic education targeted to the poorest quintile and determined by the amount of increased revenue from higher education. If a policy change tripled the average household expenditure on university education, the share of public education spending for the poorest 20% could increase from 25.1% to 28.3% for

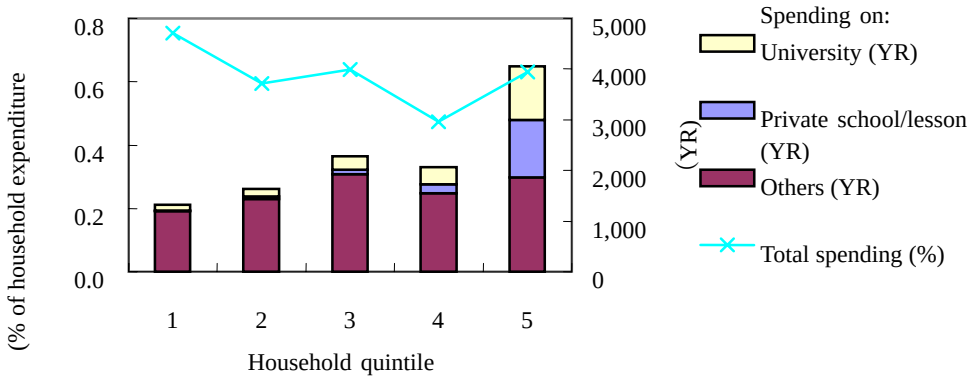

Figure 2. *Household Education Spending by Quintile*

Table 4. *Distribution of Public Spending for the poor with Changes in Cost Sharing*

	Household Quintile				
	1	2	3	4	5
Current state					
Total public education spending(yearly/per household/YR)	26,194	24,280	25,111	22,079	18,381
of which, spending on basic education	20,435	18,517	17,804	14,626	10,033
Household education expenditure(yearly/per household/YR)	1,317	1,637	2,279	2,071	4,057
of which, spending on university(yearly/per household/YR)	102	156	267	346	1,054
Illustrative future change[a]					
Additional household spending on university (per household/year/YR)	0	311	535	692	2,108
Total public education spending(yearly/per household/YR)	29,841	23,969	24,576	21,387	16,273
of which, spending on basic education	24,081	18,517	17,804	14,626	10,033
Quintile's share of total education subsidy(%)	25.7	20.7	21.2	18.4	14.0
Basic education	28.3	21.8	20.9	17.2	11.8
Household education expenditure(yearly/per household/YR)	1,317	1,949	2,814	2,763	6,165
(% of household expenditure)	0.8	0.7	0.8	0.6	1.0

Notes. [a] Assuming if a policy change tripled the average household spending on university, except for the bottom quintile and public funds were reallocated from higher to basic education targeted to the poorest quintile and determined by the amount of increased revenue from higher education.

Source: Author's estimations and simulations using data in Table 1 and the 1998 HBS.

basic education and from 22.6% to 25.7% for the education sector as a whole. The table also shows that even if households tripled their spending on university education, the total household education spending need not be more than 1% of total household expenditures either for rich or poor households. For each university student, the amount of this increase can be interpreted as an average annual increase in payments to the university of YR 13,000. As a proportion of household expenditure, even for the second lowest quintile, might amount to only 5%. As a proportion of per capita household expenditure, this increase might amount to 37% for a student from the second lowest quintile but to less than 10% for a student from the top quintile.

In sum, these illustrations imply that a threefold increase in household spending on higher education could be affordable for non-poor households and that the increase could improve the distributive role of public education spending for the poor, at least up to a benchmark equal to the school-aged population. Certainly, this is only true insofar as university students from the poorest households would be allocated grants or waivers to cover the increased fees, non-poor households would not reduce their demand for university education, and public resources would be reallocated to basic education in an amount equal to the increased revenue. Moreover, within basic education, the increase in available funds would have to be used to assist children from poor households.

Conclusions

This paper found that Yemen's public education spending is more equitably distributed than its household expenditures but that the distribution does not favor the poor in absolute terms or in proportion to the school-aged population, especially in higher education. Although this is broadly consistent with findings for other countries, a cross-country comparison indicated that the distribution of public spending on the education sector as a whole is less inequitable in Yemen than in other Asian developing countries. Moreover, it was suggested that the country should continue it's attempts at realizing its allocation policies, which are likely to be associated with better distributional consequences of public spending such as a higher level of public education spending, a lower share of recurrent education spending devoted to higher education, and a small difference in public spending per student between lower and higher levels of education. The recent increase in

investment spending on higher education and vocational training should not cause a future increase in the shares of public recurrent spending for these sub-sectors.

It was also suggested that Yemen should and could further improve the distribution of public education spending for the poor, especially in basic education. As compared with other countries, the poorest quintile's share of public spending on secondary and tertiary education was much higher, while this was not the case for basic education. Moreover, within the poor, females do not receive even half of the benefits received by males from public spending on basic education.

To increase the share of public spending on basic education for the poor, through an increase in either the number of beneficiaries or the unit cost per beneficiary among the poor, the government will need to increase the level of public resources available for this sub-sector. To realize this, the analysis of household expenditure on education suggested, as an option, changes in cost sharing in university education, with some mechanisms for directly subsidizing students from the poor, and the associated reallocation of public education resources from higher to basic education. For example, an increase that tripled household spending on higher education from the current level was assessed as affordable for non-poor households in proportion to their total household expenditures. In addition, it was illustrated that such an increase in household spending on university education could improve the distribution of public education spending for the poorest quintile at least up to a benchmark equal to the school-aged population.

Despite data and methodological limitations, this study demonstrated how a country for which the prioritization of public spending towards poverty reduction is a key policy concern could assess baseline and target benchmarks for monitoring a distributional effect of intra-sectoral budget allocations and cost sharing. Future research will be expected to estimate the benefit-incidences over time (e.g., at two points of time) and to assess the impact of spending policy changes on an increase or decrease in the distribution of public education spending for the poor. It will be also expected to include an analysis of demand-side behavior, e.g., how poor households may differently decide on the receipt of publicly subsidized education services, and an analysis of public spending within a sub-sector to effectively address determinants of the household demand for education that are specific to the poor.

References

Asian Development Bank. (2002). *Policy on education*. Manila: Asian Development Bank.

Bray, M. (2000). Financing higher education in Asia: Patterns, trends and options', prospects. *Quarterly Review of Comparative Education*, *30*(3), 331-348.

Bray, M. (2002). The costs and financing of education: Trends and policy implications. *Education in developing Asia*. Manila: Asian Development Bank & Hong Kong: Comparative Education Research Centre, The University of Hong Kong.

Castro-Leal, F. (1996a). Who benefits from public education spending in Malawi: Results from the recent education reform. Washington DC: World Bank.

Castro-Leal, F. (1996b). Poverty and inequality in the distribution of public education spending in South Africa. Washington DC: World Bank.

Castro-Leal, F., Dayton, D., Demery, L., & Mehra, K. (1999). Public social spending in Africa: Do the poor benefit. *The World Bank Research Observer*, *14*, 49-72.

Crouch, L. A. (1996). Public education equity and efficiency in South Africa: Lessons for other countries. *Economics Of Education Review*, *15*, 125-137

Demery, L. (2000). Benefit incidence: A practitioner's guide. Washington DC: World Bank.

Demery, L., Chao, S., Bernier, R., & Mehra, K. (1995). The incidence of social spending in Ghana. Washington DC: World Bank.

Hansen, W.L. & Weisbrod, B.A. (1969). *Benefits, costs and finance of public higher education.* Chicago: Markham.

International Monetary Fund. (2001). Country report republic of Yemen: Selected issues. Washington DC: International Monetary Fund.

Jallade, J. (1974). *Public expenditures on education and income distribution in Colombia*. Baltimore MD: Johns Hopkins University Press.

Lipton, M., & Ravallion, M. (1995). Poverty and policy. In J. Behrman & T. N. Srinivansan (Eds.), *Handbook of development economics (3rd ed.)* (pp. 2551-2657). North-Holland, Amsterdam.

Meerman, J. (1979). *Public expenditures in Malaysia: Who benefits and why?* New York: Oxford University Press

Republic of Yemen.(1999a). *Statistical yearbook 1998*. Sana'a: Central Statistical Organization.

Republic of Yemen. (1999b). *Summary of final results Household Budget Survey 1998.* Sana'a: Central Statistical Organization.

Republic of Yemen. (2000). *Statistical yearbook 1999.* Sana'a: Central Statistical Organization.

Republic of Yemen. (2002a). Draft national strategy for

development of basic education in Yemen. First National Basic Education Conference, Sana'a October 26-29, 2002. Sana'a: Ministry of Education.

Republic of Yemen. (2002b). Poverty reduction strategy paper 2003-2005.

Selowsky, M. (1979). *Who benefits from government expenditure: A case study of Colombia*. New York: Oxford University Press.

Tesliuc, C., & Pop, L. (2000). Poverty, inequality and social protection. In C. Ruhl & D. Daianu (Eds.), *Economic transition in Romania: Past, present and future*. Retrieved October 1, 2002, from http://www.cerope.ro/seczone/18wp.ASP.

UNESCO. (2000). *World education report*. Paris: UNESCO.

World Bank. (1994). *Colombia poverty assessment report*. Washington DC; World Bank.

World Bank. (1995a). *Kenya poverty assessment*. Washington DC: World Bank.

World Bank. (1995b). *Lao PDR social development assessment and strategy*. Washington DC: World Bank.

World Bank. (1996a). *Bangladesh Public Expenditure Review.* Washington DC: World Bank.

World Bank. (1996b). *Madagascar poverty assessment.* Washington DC: World Bank.

World Bank. (1999a). *Education sector strategy*. Washington: World Bank.

World Bank. (1999b). *Former Yugoslav Republic of Macedonia focusing on the poor.* Washington DC: World Bank.

World Bank. (1999c). *Tanzania: Social Sector Review*. Washington DC: World Bank.

World Bank. (2000a). *World development report 2000/2001*. New York: Oxford.

World Bank. (2000b). *Making transitional work for everyone poverty and inequality in Europe and Central Asia.* Washington DC: World Bank.

World Bank. (2000c). *Viet Nam managing public resources better: Public expenditure review 2000.* Washington DC: World Bank.

World Bank. (2000d). *Ecuador: crisis, poverty and social services.* Washington, DC: World Bank.

World Bank. (2000e). *Project appraisal document: Yemen basic education expansion project.* Washington DC: World Bank.

World Bank. (2001a). *Kingdom of Morocco poverty update*. Washington DC: World Bank.

World Bank. (2001b). *Peruvian education at a crossroads challenges and opportunities for the 21st century*. Washington DC: World Bank.

World Bank. (2002). *Republic of Yemen poverty update.* Washington DC: World Bank.

Younger, S. (2003). Benefits on the margin: Observations on marginal benefit incidence. *The World Bank Economic Review*, *17*(1), 89-106.

Yuki, T. (in press). Distribution of public education spending in developing countries. *The Japanese Journal of Evaluation Studies*, *3*(2).

Notes.

[i] Much of the information presented here is based on information from the World Bank (2002) and the author's interviews with governmental officials during visits to Yemen in February 2001 and October 2002.

[ii] The author's estimation is based on data from the 1999 National Poverty Phenomena Survey (1999 NPS), which provides more information on education services. However, the 1999 NPS was not used for the benefit-incidence analysis because it is a one-month survey and the reliability of household expenditure data is considered lower than that of the 1998 HBS.

[iii] See the numerous articles regarding university tuition fees that appeared in the *Yemen Times (http://yementimes.com)* from 1999 to 2002.

[iv] The HBS-98 provides figures on yearly household spending on education within the following categories: fees and expenses for nurseries and kindergartens, government schools, private schools, and university; expenses for school books, university books, private tuition (expenses for private lessons), books and pens for writing and drawing, and school bags. However, as there is no information on how much each household spends on a particular household member, it is impossible to accurately estimate private spending by level of education.

Received October 12, 2002
Revision received September 15, 2003
Accepted September 29, 2003